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Original Research

Evaluation of effectiveness of topical anesthetic agent on pain and discomfort during scaling in patients with gingivitis

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ABSTRACT:

Control over pain and discomfort is an important outcome measure of successful periodontal therapy. Intrasulcular anesthetic gel can be used as a secure alternative anesthesia for pain control and discomfort during scaling and root planning. **Aims and objective:** To evaluate clinically the effectiveness of anesthetic gel lignocaine on the pain and discomfort during scaling in patients with gingivitis. **Material and method:** Ten gingivitis patients were recruited in the study. Draw of lots was done to decide scaling of that quadrant without placement of gel, then clockwise rotation of scaling of quadrants was done for with (Group I) and without (Group II) intrasulcular placement of anesthetic gel. Scaling was done to render mouth plaque free for 10 minutes in each quadrant..Intergroup comparison was done using Visual Analog Scale (VAS) and Verbal Rating Scale (VRS) in all the four quadrants. **Results:** Statistically significant difference was observed in pain and discomfort as per the VAS and VRS scores in patients with or without application of anesthetic gel. **Conclusion:** Intrasulcular placement of anesthetic gel may be an effective measure in controlling pain and discomfort during scaling.

Key words: Scaling, intrasulcular anesthetic, gingivitis, pain.

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INTRODUCTION

Gingivitis is a disease characterized by the presence of clinical signs of inflammation that are confined to gingiva and is associated with teeth showing no attachment loss.[1] Controlling gingivitis by regular plaque removal is based on the fact that if supragingival plaque is left undisturbed, it will become subgingival with potential to become colonized by pathogenic bacteria. Thus removal of dental plaque leads to resolution of gingival inflammation, retards formation of calculus and facilitates the good oral health.

Nonsurgical therapy-scaling and root planning (SRP) is the most commonly used procedure for both gingivitis and periodontitis. The underlying concept of this therapy is based on the non-specific plaque hypothesis and is aimed towards effective elimination of dental plaque. Scaling is often associated with discomfort and pain more specifically subgingival scaling [2]

Pain control is an integral part of modern dentistry. Fear, anxiety and pain are interrelated which leads to discomfort. Dental fear and anxiety emanates from different causes, though most may be traced to previous negative experiences such as hearing negative encounters from family and friends or, perhaps, a general fear of needles.[3] Control over pain and discomfort is an important outcome measure of successful periodontal therapy. Topical anesthetics are a boon to dentists in their attempts to protect with pain free therapy.

Topical anesthesia also plays a significant role in the field of dentistry. The first local anesthetic (cocaine) was a topical anesthetic and was serendipitously

discovered to have anesthetic properties, when Albert Niemann in 1860, tested his newly isolated compound and noted that it caused numbing of the tongue.[4]The discovery of various amide and ester local anesthetics, their topical preparations and delivery systems in due course of time opened the gate of immense possible uses of topical anesthetics procedures.

Lignocaine, the first amino amide–type local anesthetic, was first synthesized under the name 'xylocaine' by Swedish chemist Nils Lofgren in 1943.[5] The topical anesthetic lignocaine used in the procedures has been found to have antibacterial effects on various microorganisms. The present study was conducted to show that intrasulcular anesthetic gel can be used as a secure alternative anesthesia for pain control and discomfort during scaling and root planning.

MATERIAL AND METHOD

The study comprised of 10 gingivitis patients with informed consent taken. Ethical clearance for the study was obtained from ethical committee prior to study. A randomized, split mouth clinical trial was conducted to evaluate efficacy of topical anesthetic agent lignocaine on pain and discomfort during scaling in patients with gingivitis. Systemically healthy male and female patients from the age group within 18- 50 years were recruited in the study. Patients should not have undergone SRP in last six month. Presence of six teeth should be in each quadrant. Patients were not included with history of sensitivity to any anesthetic agents. Also those who were on any analgesics or antibiotic therapy and with acute periodontal pain, pulpitis, abscesses, or other acute infection were not included.

a-f: pre scaling view, **g-l:** application of lignocaine and scaling , **m-q:** post scaling view

Figure 1

Ten gingivitis were divided in four quadrants each which were divided in two groups of with Lignocaine as Group I and without lignocaine Group II. Draw of lots was done to decide scaling of that quadrant without placement of gel, then clockwise rotation of scaling of quadrants was done for with (Group I) and without (Group II) intrasulcular placement of anesthetic gel. Scaling was done to render mouth plaque free for 10 minutes in each quadrant.(Figure 1)

Intergroup comparison was done using Visual Analog Scale (VAS) and Verbal Rating Scale (VRS) in all the four quadrants. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

The t test was used for statistical analysis. No participants asked for more than 2 application of anaesthetic lignocaine. Twenty one patients in the age range of 18 to 40 years (mean 25.57±6.554) included 5 female participant. Table 1 shows descriptive statistics with VAS score 0.931 and VRS score 0.835 as mean standard deviation. Intragroup comparison with mean with and without anesthesia in VAS was 14.75 and 26.25 and VAS was 15.90 and 25.10 which indicates reduction in pain and anxiety in both the scales in table 2. Paired t test and Mann-Whitney test shows decrease in VAS greater to that VRS on intergroup comparison in table 3.The intergroup comparison was statistically significant for VAS score and non significant for VRS score in table 4 and graph 1 and 2.

RESULTS

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
VAS	40	2.58	.931	1	5
VRS	40	2.05	.815	1	4
Group	40	1.50	.506	1	2

Table 1

Ranks

	Group	N	Mean Rank	Sum of Ranks
VAS	Without Anaesth	20	26.25	525.00
	With Anaes	20	14.75	295.00
	Total	40		
VRS	Without Anaesth	20	25.10	502.00
	With Anaes	20	15.90	318.00
	Total	40		

Table 2

Test Statistics[b]

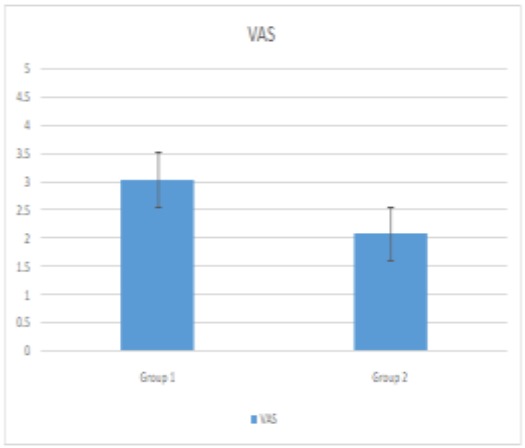
	VAS	VRS
Mann-Whitney U	85.000	108.000
Wilcoxon W	295.000	318.000
Z	-3.296	-2.696
Asymp. Sig. (2-tailed)	.001	.007
Exact Sig. [2*(1-tailed Sig.)]	.001[a]	.012[a]

Table 3

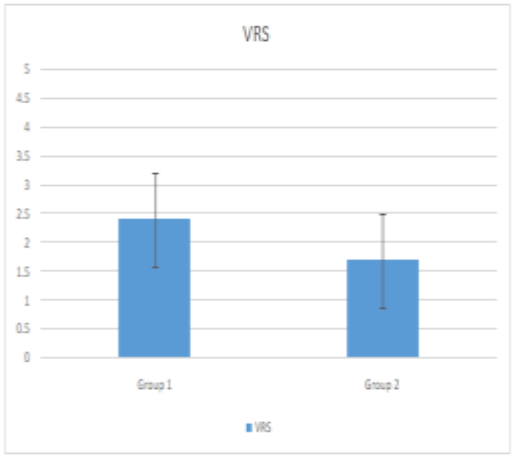
Intergroup comparison of Visual Analog Scale and Verbal Rating Scale

Group	No. of Quadrants (n)	Mean Rank	Mann- Whitney U test	P
VAS				
Without Lignocaine	20	26.25	85	0.001
With Lignocaine	20	14.75		
VRS				
Without Lignocaine	20	25.10	108	0.007
With Lignocaine	20	15.90		

Table 4



Graph 1



Graph 2

DISCUSSION

The word anesthesia is a compound word from the Greek words an- ("without") and aesthesis ("sensation"). 40% of all periodontal scaling procedures performed, involve some kind of anesthesia.[5]

Topical anesthesia is defined as superficial loss of sensation in conjunctiva, oral mucous membranes, or skin, produced by direct application of local anesthetic solutions, ointments, gels or sprays. They have an advantage of easy administration generate positive responses towards dental treatment in patients. Topical anesthetics alter pain thresholds by controlling pain sensations through a blockade of signals that are transmitted from the peripheral sensory nerve fibers. They are effective in blocking the pain stimuli in the superficial layer of the mucosa.[6] While using them, careful attention must be paid to their pharmacology, area and duration of application, age and weight of the patients and possible side-effects. Their delivery and effectiveness can be enhanced by using free bases; by increasing the drug concentration, lowering the melting point; by using physical and chemical permeation enhancers and lipid delivery vesicles.[7]

Lignocaine, the first amino amide–type local anesthetic, was first synthesized under the name 'xylocaine' by Swedish chemist Nils Lofgren in 1943.[5]The topical anesthetic lignocaine used in the procedures has been found to have antibacterial effects on various microorganisms.[8] Lignocaine alters signal conduction in neurons by prolonging the inactivation of fast voltage gated sodium channels in neuronal cell membrane responsible for action potential propagation.[9] It has a low incidence of allergic reactions but is absorbed systemically and application of excessive amounts of topical lidocaine may absorb rapidly into the cardiovascular system leading to higher local anesthetic blood levels with an increased risk, especially in the pediatric patient, of overdose reaction. Thus a minimal amount of topical gel should be applied to the tissue and a metered spray is suggested if an aerosol preparation is selected. Topical local anesthetics are considered relatively safe and not many adverse reactions have been associated with them. The most common side effect is tissue stimulation (when topical anesthetics are applied for prolonged periods) and a temporary altered sense of taste.[10]

Similar studies by Petersilka G J et al studied evaluation of the safety and efficacy of a topical lidocaine gel 2% during scaling and root planning and professional mechanical plaque removal and concluded it safe and effective pain free therapy.[11] Gupta et al also concluded that topical anesthetic agents and lignocaine in making pain free therapy possible compared needle technique.[12]

CONCLUSION

Intrasulcular placement of anesthetic gel may be an effective measure in controlling pain and discomfort during scaling. Lignocaine can be used as an effective alternative during scaling.

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